

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Koji ABE, et al. Group Art Unit: 1795
Serial No: 10/564,852 Examiner: Laura S. Weiner
Filed: January 17, 2006
For: NON-AQUEOUS ELECTROLYTIC SOLUTION FOR LITHIUM
SECONDARY BATTERY AND LITHIUM SECONDARY BATTERY
USING THE SAME

Hon. Commissioner for Patents

DECLARATION PURSUANT TO RULE 132

I, Kazuhiro MIYOSHI, one of the above-named applicants,
declare and state that:

1. I am familiar with the prosecution history of the
subject patent application.

2. I now submit the following additional experimental
data which were obtained in experimental runs carried out
under my supervision.

Procedures for the experimental runs

The experimental procedures of Example 13 for the prepa-
ration of a cylindrical battery given in the specification of
the subject patent application were repeated except that the
following modifications were made:

Run 1: A non-aqueous electrolytic solution was pre-
pared using no vinylene carbonate and 3.2 wt.% of di(2-prop-
ynyl) oxalate.

Run 2: A non-aqueous electrolytic solution was pre-
pared using 10 wt.% of vinylene carbonate and 0.2 wt.% of
di(2-propynyl) oxalate.

The initial discharging capacity and the discharge capacity retention after 300 cycle charge-discharge procedures for each cylindrical battery are set forth in the following Table.

	Vinylene carbonate (%)	Di(2-propynyl) oxalate (%)	Initial discharging capacity	Discharge capacity retention
Run 1	0	3.2	1.00	66.6%
Run 2	10	0.2	1.00	67.9%
Example 13	3	0.2	1.00	81.7%
Com. Ex. 1	3	0	1.00	64.3%

Remarks: Discharge capacity retention is 300 cycle retention. Initial discharging capacity is a relative value. Data of Example 13 and Comparison Example 1 are copied from the description given in the specification.

3. Observation

It is my conclusion that the lithium secondary battery of our claimed invention which employs a specific combination of the positive electrode and negative electrode having a high density and a non-aqueous electrolytic solution containing a combination of a small amount of vinylene carbonate and a small amount of an alkyne compound of formula (IV), that is, Example 13, shows a prominently improved discharge capacity retention, as compared with lithium secondary battery which employs the same positive and negative electrode combination but employs the alkyne compound alone (Run 1), a combination of a relatively large amount of vinylene carbonate and a small amount of the alkyne compound (Run 2), and vinylene carbonate alone (Comp. Ex. 1).

The above-mentioned declarant declares further that all

statements made herein of his own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that any willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Kazuhiro Miyoshi
Kazuhiro MIYOSHI

October 27, 2010